OPERATING INSTRUCTIONS FOR PNEUMATIC DIESEL ENGINE FIRE PUMP CONTROLLER TYPE EFP/NFPAW/80/PN & EFP/NFPA/80/PN

GENERAL

These operating instructions are applicable to the Metron Eledyne pneumatic diesel engine fire pump controller type EFP/NFPAW/80/PN. The components which form the control circuit are contained within a NEMA 4X (IP65) double door enclosure. This manual is also applicable to the fire pump controller type EFP/NFA/80/PN which is housed in a single door NEMA 2 enclosure.

This controller is a fully-automatic pneumatic engine start system which complies with the requirements of National Fire Codes NFPA No. 20, and the system is a Factory Mutual (FM) approved design for 'Engine Driven Fire Pump Controllers'.

The control system operates from a regulated 5 BAR air supply derived a single air source (at 10 bar maximum), which powers the air start system. The system provides a single crank of 90 seconds which is factory set.

The system is fitted with a 'Manual Start' facility, the controls of which are independent of the 'Autostart' control system. The manual start controls are located behind a hinged switch cover. Access to 'Manual Start' controls in emergency conditions may be obtained by smashing the hinged switch cover glass panel.

The controller is also fitted with a 'Test' facility which enables the operator to initiate a test start, via the automatic start system locally at the controller.

Engine shutdown is achieved by pressing the 'Engine Shutdown' pushbutton which activates the stop circuit and timer. The controller is fitted with visual status and fault semaphore flag indicators. The system also provides electrical volt free outputs to facilitate remote monitoring.

LOGIC MODULE

The logic elements which form the control system are mounted on the back panel of the control cabinet. Each element shown on the logic diagram has a letter and number identifier, this corresponds to the grid reference attached to the logic module. This method of identification enables the user to quickly locate the physical position of a specific element. Refer to the logic diagram.

Each logic element incorporates 1 or 2 pressure indication pistons, which when lightly pressed, retract if the corresponding port is de-pressurised. When the port is under pressure the piston immediately reappears. This facility assists in tracing the logical train of events.
(See Additional Manufacturers Component Information).

SAFETY VENT

The enclosure is fitted with a safety vent (Located in the gland plate), which prevents any pressure build up within the enclosure due to component venting

CAUTION
Under no circumstances obstruct or block the safety vent in any way.

DEFINITION OF TERMS

Visual	Gauge, semaphore or flag etc.
Audible	Alarm horn
Volt free	Remote indicating volt free changeover contacts
Clear	Returned to non-activated condition
Standby	System awaiting an operational event
Normal	Parameters within designed limits

PRESSURISING THE CONTROL SYSTEM

All controller connections	In accordance with the System Diagram
Set the Mode switch	Man.
Set pressure switches and regulators.	PS1 - 5 Bar. Air Pressure Low PS3 - 10 Bar. Air Press High Pressure switch. PR1 - 5 Bar. Control supply regulator. PR2 - 1.5 Bar. Start Pressure Switch regulator

Note: Air pressure failure levels can be adjusted during commissioning to take into account minimum satisfactory cranking pressure.

Open Air Supply valve IVA	Gauge PG1 shows air pressure
Press Cancel Alarm/Reset Controller pushbutton.	Controller in standby condition

Manual Mode

Visual	Air Supply Healthy - Green. Alarm on - black
All other flags.	Normal
Audible.	Silent.
Volt free:	Normal
All others	Normal

Notes:

1. With the controller door open the audible alarm is disabled but the 'Alarm On' indicator shows Red on alarm or Black for standby.

2. It is assumed that the controller air supply is derived from an air receiver, which is pressurised to more than 10 Bar, via pressure reducing valves set to an absolute maximum of 10 Bar.

AIR PRESSURE FAILURE.

Air supply goes below 5 Bar.	Air Supply pressure gauge shows reduced pressure.
Visual.	Air Supply Healthy - Black.
Audible.	Sounds.
Volt free.	Fault On Engine Or Controller
Pressure restored to normal.	Alarms remain active.
Press Cancel Alarm/Reset Controller pushbutton.	Alarms clear.
Air supply goes below 2 bar	The logic cannot reliably operate under these conditions.
Air supply goes substantially below 2 bar	

Volt free	Fault on engine or controller

Controller off or in manual.

HIGH AIR PRESSURE AT THE CONTROLLER.

Air supply goes above 10 bar	Air supply pressure gauge shows air pressure above normal.
Visual.	Air Supply High Pressure - Red.
Audible.	Sounds.
Volt free.	Fault On Engine Or Controller .
Pressure restored to normal.	Alarms clear automatically.

Note: Air receiver over pressure is not monitored.

MANUAL OPERATION

MANUAL MODE.

Selected mode	Manual.
Visual.	Air Supply Healthy - Green.
All others	Black.
Audible.	Silent.
Volt free:	Controller Off Or In Manual
All others	Normal

MANUAL START.

Press Manual Start pushbutton.	Engine starts and runs up to speed. Cranking is automatically cut off. Running fuel actuator is pressurised (If used).
Visual.	Engine Running - Red.
Volt free:	Engine Running.

Note
In an emergency, 'Smash The Break Glass Panel' to gain access to the manual start controls. 'Emergency 'Manual Start' operating instructions are provided on a label fitted to the hinged 'Break Glass Flap'.

MANUAL STOP

Press Engine Shutdown pushbutton.	Engine stop actuator is pressurised and autostart is inhibited. Running fuel actuator is de-pressurised (If used).
Release Engine Shutdown pushbutton.	Engine stop actuator remains pressurised and autostart inhibited until the stop timer times out.
Engine.	Stops.
Visual.	Engine Running - black
Volt free .	Normal
Controller status.	Manual mode standby.

AUTOMATIC OPERATION

AUTO MODE.

Select Auto Mode.

Visual.	Air Supply Healthy - Green. Auto Mode On - Green. All others - Black.
Audible.	Silent.
Volt free.	Normal

AUTOSTART.

If fire main pressure goes low or the remote start signal de-pressurises.	Pressure switch initiates pump on demand.
Visual.	Pump On Demand - Red.

Without delay.	Crank cycle latches in operation. Running fuel actuator is pressurised (If used).
Visual.	Crank Timer Operating - Red.
Engine cranks, a continuous 90 second duration Engine starts and runs up to speed. Cranking is automatically cut off. Crank timer runs on to auto reset.	
Visual.	Engine Running - Red. Pump On Demand - Red
Volt free.	Engine Running Pump On Demand
Pump restores firemain pressure when demand for firewater ceases.	Engine continues to run until shutdown by the operator at the controller.
Visual.	Pump On Demand - Black.
ENGINE STOP.	
Press Engine Shutdown pushbutton.	Engine stop actuator is pressurised and autostart is inhibited. Running fuel actuator is de-pressurised (If used).
Release Engine Shutdown pushbutton.	Engine stop actuator remains pressurised and autostart is inhibited until the stop timer times out.
Engine.	Stops.
Visual.	Engine Running - Black.
Volt free.	Engine Running -clears
Controller status.	Auto mode standby.

ENGINE PROTECTION AND MONITOR SYSTEM

(In normal operational mode).

OVERSPEED

If the engine overspeeds.	Engine stop actuator is pressurised and Autostart is inhibited. The engine stops.
Visual.	Engine Overspeed - Red.
Audible.	Sounds.
Volt free.	Fault On Engine Or Controller

If necessary reset the engine speed switch.

Ress Cancel Alarm/Reset controller push button.

Controller status	Auto mode standby.

LOW OIL PRESSURE

With engine stopped, oil pressure is low.	Alarms are inhibited.
When the engine runs.	Engine fault timer starts. (0-30 seconds)
Engine fault timer times out	Engine low lube oil pressure monitor is primed for operation.

If the engine lube oil pressure goes low.

Visual.	Low Oil Pressure - Red.
Audible.	Sounds.
Volt free.	Fault On Engine Or Controller
Low oil pressure restored or engine stops.	Alarms clear.

LOW OIL PRESSURE PRESS TO TEST.

With the engine stopped, press Oil Circuit

Press To Test pushbutton.

Visual.	Low Oil Pressure indicator goes Red very briefly and then stays Black.
In the case of a defective engine mounted pressure device.	Low Oil Pressure indicator stays Red.

HIGH WATER TEMPERATURE.

With the engine stationary.	Engine water temperature monitor is inhibited.
When the engine runs.	Engine fault timer starts. (0-30 seconds)
Engine fault timer times out.	Engine Water temperature is primed for operation

If the water temperature goes high

Visual	Engine high water temperature
Audible	Sounds
Volt free	Fault on engine or controller.
Channel sensor clears.	Alarms clear automatically.

Spare Fault Channel Monitors:

Spare fault channel activates

Visual	Channel indicator - red
Audible.	Sounds
Volt free.	Fault on engine or controller.
Channel sensor clears.	Alarms clear automatically.

WEEKLY TEST

WEEKLY START TIMER INITIATED

10080 minutes (one week) after the last engine shutdown, the time count equals the set time on the display. (10080).	The drain valve energises. Cranking is established.
Visual.	Pump On Demand - Red until drain valve de-energises. Crank Timer Operating - Red. Drain valve on - Red.
After a brief delay.	
The engine starts.	
Visual.	Engine Running - Red. Crank Timer Operating resets.
Volt free.	Engine running

WEEKLY START TIMER SETTING

To set the count of 10080, (Minutes/week) press the white lever in the direction shown by the arrow and hold it there.

Use the pushbuttons to enter the respective digits.

Release the white lever.

TEST START SWITCH

Turn the mode switch to Test position	
	The drain valve energises. Cranking is established.
Visual.	Pump On Demand - Red until drain valve de-energises. Crank Timer Operating - Red. Drain valve on - Red.
After a brief delay.	
The engine starts.	

Visual.	Engine Running - Red. Crank Timer Operating resets.
Volt free.	Engine running

ANTICONDENSATION HEATER

The heater is maintained at a temperature determined by an adjustable thermostat, the sensor of which is built into the heater assembly.

Heater surface temperature is limited.

Warning
Under no circumstances remove the thermostat Ex 'd' container cover whilst the mains supply is energised.

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